

IGCSE CHEMISTRY

Test on Metals

Q.1 Zinc and copper are elements next to each other in the Periodic Table.

(a) Zinc is obtained from zinc blende in a two-step process.

Outline how each of these steps are done.

step 1

.....

chemical equation

step 2

.....

chemical equation

removal of zinc in **step 2**

.....[5]

(b) Name the alloy formed when zinc is mixed with copper.

..... [1]

(c) Copper is a transition element. It can have variable oxidation states.

State **two** other chemical properties of transition elements which make them different from

Group I elements.

1

2[2]

(d) A compound of copper can be used to test for water.

(i) State the full name of this compound of copper.

..... [1]

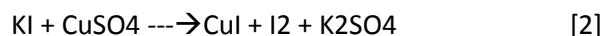
(ii) State the colour change that occurs when water is added to this compound of copper.

from to

[2]

(e) Aqueous potassium iodide reacts with aqueous copper(II) sulfate to produce iodine.

(i) Balance the chemical equation for this reaction.



(ii) Deduce the charge on the copper ion in CuI .

..... [1]

(iii) In terms of electron transfer, explain why copper is reduced in this reaction.

..... [1]

(iv) Identify the reducing agent.

..... [1]

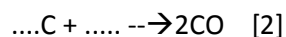
This question is about iron and iron compounds.

Q 2. (a) Name the main ore of iron.

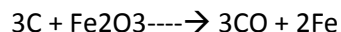
..... [1]

(b) In a blast furnace used for the extraction of iron, carbon reacts with oxygen from the air to form carbon monoxide.

Complete the chemical equation for this reaction.



(c) In the hotter parts of the furnace, carbon reacts with the iron(III) oxide present in the iron ore.

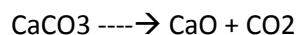


How does this equation show that carbon is oxidised?

.....

..... [1]

(d) Limestone is added to the blast furnace. The limestone is converted into calcium oxide and carbon dioxide. The reaction is endothermic.



(i) What type of chemical reaction is this?

..... [1]

(ii) What type of oxide is calcium oxide?

Give a reason for your answer.

.....
..... [2]

(e) Iron is a metal.

Give **three** physical properties that are characteristic of metals.

- 1
- 2
- 3 [3]

Q 3. Aluminium is extracted from aluminium oxide by electrolysis.

(a) Why is aluminium **not** extracted by heating aluminium oxide with carbon?

.....
..... [1]

(b) Aluminium oxide is an ionic compound with a high melting point.

(i) Complete the dot-and-cross diagram to show the electron arrangement in **one** of the oxide ions present in aluminium oxide. Include the charge on the oxide ion.

(ii) The melting point of aluminium oxide is above 2000 °C.

Explain why aluminium oxide has a high melting point.

.....
.....

..... [2]

(c) Aluminium can be extracted by electrolysis

(i) Name the type of particle responsible for the transfer of charge in

the wires,

the electrolyte.[2]

(ii) Give **two** reasons why cryolite is used.

1

2[2]

(iii) Write the ionic half-equation for the formation of aluminium during the electrolysis.

..... [1]

(iv) Explain how carbon dioxide gas is formed at the anodes.

.....

.....

..... [3]